The opinion in support of the decision being entered today was ***not*** written for publication and is ***not*** binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICHAEL KWAN
and ERIC LIU

Appeal No. 2005-1668
Application 09/920,891

ON BRIEF

Before WARREN, WALTZ and DELMENDO, *Administrative Patent Judges.*

WARREN, *Administrative Patent Judge.*

Decision on Appeal and Opinion

We have carefully considered the record in this appeal under 35 U.S.C. § 134, including the opposing views of the examiner, in the supplemental answer mailed February 3, 2005, and appellants, in the brief, the reply brief and the supplemental reply brief filed March 25, 2005,[1] and based on our review, find that we cannot sustain the ground of rejection advanced in the supplemental answer: appealed claims 17 through 22 under 35 U.S.C. § 103(a) as being unpatentable over Hong et al. (Hong) in view of Papasouliotis et al. (Papasouliotis) as evidenced

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[1] The supplemental answer was filed in response to our remand entered January 19, 2005, in Appeal No. 2005-0003 in this application, and appellant filed the supplemental reply brief in response.

by Orczyk et al. (Orczyk), Kholodenko et al. (Kholodenko) and Sherstinsky et al. (Sherstinsky) (supplemental answer, pages 4-6).[2,3]

Our consideration of the ground of rejection requires that we initially interpret representative appealed independent claim 17 by giving the terms thereof the broadest reasonable interpretation in their ordinary usage as they would be understood by one of ordinary skill in the art in light of the written description in the specification, including the drawings, as interpreted by this person, unless another meaning is intended by appellants as established in the written description of the specification, and without reading into the claims any limitation or particular embodiment disclosed in the specification. *See, e.g., In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). The plain language of claim 17 specifies a computer-readable storage medium having a computer-readable program embodied therein for directing operation of a substrate processing system in accordance with the steps, among others, of "(b)" generating a first high-density plasma in the process chamber to deposit a first portion of the film on the substrate by HDP-CVD, "(c) thereafter, cooling the substrate," "(d) thereafter, flowing an etchant gas into the process chamber," "(e) thereafter, providing a second gaseous mixture to the process chamber," and "(f)" generating a second high-density plasma in the process chamber for a second HDP-CVD step. Similar claim language appears in appealed independent claim 20.

The issues in this appeal involve the interpretation of claim term "thereafter." We determine that one of ordinary skill in the art would recognize from the written description in the specification that this term is used in its ordinary, dictionary meaning in context of "[f]rom a specific time onward; from then on."[4] Thus, the computer-readable program must include a separate substrate cooling step after completion of the first HDP-CVD step; a separate etching

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[2] Appealed claims 17 through 22 are all of the claims in the application. See the appendix to the brief.

[3] The examiner includes Wang et al. in the listing of Prior Art of Record (supplemental answer, page 3) but does not mention the patent in the remainder of the supplemental answer.

[4] *See, e.g., The American Heritage Dictionary, Second College Edition* 1261 (Boston, Houghton Mifflin Company, 1982); *Webster's II New Riverside University Dictionary* 1200 (Boston, Houghton Mifflin Company. 1988).

step after completion of the separate substrate cooling step; and a separate step of providing a second gaseous mixture for the HDP-CVD step after completion of the separate etching step.

We agree with appellants that the examiner has not identified a disclosure of a separate cooling step in any of the applied references (supplemental reply brief, page 2). In this respect, we further agree with appellants (supplemental reply brief, pages 3-4) that Kholodenko (col. 1, l. 56, to col. 2, l. 3) and Sherstinsky (col. 2, ll. 15-27) would have disclosed that the substrate should be cooled during the etching step to maintain the substrate within a narrow temperature range, while Papasouliotis (col. 8, ll. 6-45) would have disclosed that the temperature can be modulated during etching by cooling or heating the substrate. We note here that the examiner relies on Orczyk to show that "chemical vapor deposition typically requires elevated temperature" (supplemental answer, page 5). We find that Hong is silent with respect to etch temperature (e.g., col. 5, l. 40, to col. 6, l. 35, col. 10, l. 40, to col. 11, l. 3 and col. 12 ll. 13-28).

The examiner attempts to fill the gap between the evidence provided in the combined teachings of the references and the invention encompassed by the appealed claims by alleging that the "[r]elationship of deposition and etch to temperature is well known to people of ordinary skill in the art," and in this respect, relies on the teachings of Kholodenko and Sherstinsky to support the conclusion that a separate cooling step before the etch step "to be able to control the substrate temperature properly for etch" was within the ordinary skill in the art (supplemental answer, page 5). The examiner further alleges that the "general" teachings in Papasouliotis, Hong and Orczyk establish that "it would have been obvious that in general a cooling step after deposition may be needed in preparation for etching, at least in case, change of temperature in Papasouliotis turns out to be cooling for a specific purpose," and that, in view of the teachings in Sherstinsky and Kholodenko, "[a]s plasma and ion bombardment is the cause of substrate heat during etch, it would be obvious and prudent to make sure that the cooling system is ready before the plasma is turned on for etching since, [*sic*] cooling is never instantaneous" (*id.*, pages 7-8).

We find no evidence in the record establishing the actual temperature range(s) at which etching steps are conducted in the vapor deposition arts or the relationship of actual etch temperature range(s) to actual deposition temperature range(s) in this art, even though the examiner alleges that such information is well known to those of ordinary skill in this art. In the

absence of such evidence, it is apparent that the examiner's position is one of speculation, which, of course, is not the standard for the application of prior art to a claimed invention under § 103(a). *See generally, In re Rouffet*, 149 F.3d 1350, 1358, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998) ("hindsight" is inferred when the specific understanding or principal within the knowledge of one of ordinary skill in the art leading to the modification of the prior art in order to arrive at appellant's claimed invention has not been explained.); *In re Dow Chem. Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988) ("The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that [the claimed process] should be carried out and would have a reasonable likelihood of success viewed in light of the prior art. [Citations omitted] Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure.").

Accordingly, in the absence of a *prima facie* case of obviousness within the meaning of 35 U.S.C. § 103(a), we reverse the ground of rejection.

The examiner's decision is reversed.

Reversed

CHARLES F. WARREN)
Administrative Patent Judge)
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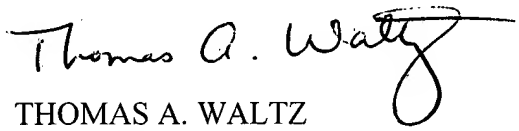
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